X20PS9602

Data sheet
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Publishing information

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Disclaimer

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1 General information

1.1 Other applicable documents

For additional and supplementary information, see the following documents.

Other applicable documents

Document name	Title
MAX20	X20 System user's manual

1.2 Order data

Order number	Short description	Figure
	System modules for Compact-S PLC	
X20PS9602	X20 power supply module, for Compact-S PLC and internal I/O power supply, X2X Link power supply, supply not galvanically isolated	
	Required accessories	
	System modules for Compact-S PLC	
X20BB52	X20 Compact-S bus base, for Compact-S PLC and Compact-S PLC power supply module, base for integrated RS232 interface, X20 connection, X20 end cover plates (left and right) X20AC0SL1/X20AC0SR1 included	
X20BB53	X20 Compact-S bus base, for Compact-S PLC and Compact-S PLC power supply module, base for integrated RS485 interface, X20 connection, X20 end cover plates (left and right) X20AC0SL1/X20AC0SR1 included	
X20BB57	X20 Compact-S bus base, for Compact-S PLC and Compact-S PLC power supply module, base for integrated RS232 and CAN bus interface, X20 connection, X20 end cover plates (left and right) X20AC0SL1/X20AC0SR1 included	
X20BB62	X20 Compact-S bus base, for Compact-S PLC and Compact-S PLC power supply module, base for integrated RS232 interface, slot for X20 interface module, X20 connection, X20 end cover plates (left and right) X20AC0SL1/X20AC0SR1 included	
X20BB63	X20 Compact-S bus base, for Compact-S PLC and Compact-S PLC power supply module, base for integrated RS485 interface, slot for X20 interface module, X20 connection, X20 end cover plates (left and right) X20AC0SL1/X20AC0SR1 included	
X20BB67	X20 Compact-S bus base, for Compact-S PLC and Compact-S PLC power supply module, base for integrated RS232 and CAN bus interface, slot for X20 interface module, X20 connection, X20 end cover plates (left and right) X20AC0SL1/X20AC0SR1 included	
X20BB72	X20 Compact-S bus base, for Compact-S PLC and Compact-S PLC power supply module, base for integrated RS232 interface, 2 slots for X20 interface modules, X20 connection, X20 end cover plates (left and right) X20AC0SL1/X20AC0SR1 included	
X20BB77	X20 Compact-S bus base, for Compact-S PLC and Compact-S PLC power supply module, base for integrated RS232 and CAN bus interface, 2 slots for X20 interface modules, X20 connection, X20 end cover plates (left and right) X20AC0SL1/X20AC0SR1 included	
X20cBB52	X20c Compact-S bus base, coated, for Compact-S PLC and Compact-S PLC power supply module, base for integrated RS232 interface, X20 connection, X20 end cover plates (left and right) X20AC0SL1/X20AC0SR1 included	
X20cBB57	X20c Compact-S bus base, coated, for Compact-S PLC and Compact-S PLC power supply module, base for integrated RS232 and CAN bus interface, X20 connection, X20 end cover plates (left and right) X20AC0SL1/X20AC0SR1 included	
	Terminal blocks	
X20TB12	X20 terminal block, 12-pin, 24 VDC keyed	

Table 1: X20PS9602 - Order data

1.3 Module description

The power supply module is used together with an X20 Compact-S controller. It has a feed for the Compact-S controller, X2X Link and the internal I/O power supply.

This module is intended as a cost-effective power supply module for small X20 systems. The use of potential groups is possible. Expansion or redundancy of the X2X Link network with power supply module X20PS3300 or X20PS3310 is not possible. Expanding the X20 system with a bus transmitter is also not permitted.

- Supply for the Compact-S controller, X2X Link and internal I/O power supply
- Cost-effective power supply module for small X20 systems
- No galvanic isolation of supply and controller / X2X Link power supply
- Expansion or redundancy of the controller / X2X Link power supply not possible through parallel operation of multiple power supply modules
- RS232 configurable as online interface (if available on bus base)
- CAN bus or RS485 (if available on bus base)

Functions:

- Monitoring the operating limits

Monitoring operating limits

The voltage of the I/O power supply is monitored for voltage overshoot or undershoot.

2 Technical description

2.1 Technical data

Order number	X20PS9602
Short description	
Power supply module	24 VDC power supply module for Compact-S PLC, X2X Link power supply and I/O
Interfaces	1x RS232, 1x RS485, 1x CAN bus [1]
General information	
B&R ID code	0xEB04
Status indicators	Operating state, module status, RS232, RS485, CAN bus [1]
Diagnostics	
Module run/error	Yes, using LED status indicator and software
CAN bus data transfer [2]	Yes, using LED status indicator
RS232 data transfer [3]	Yes, using LED status indicator
RS485 data transfer [4]	Yes, using LED status indicator
Overload	Yes, using LED status indicator and software
Power consumption for X2X Link power supply [5]	1.64 W
Power consumption [5]	
Internal I/O	0.6 W
Additional power dissipation caused by actuators (resistive) [W]	-
Certifications	
CE	Yes
UKCA	Yes
ATEX	Zone 2, II 3G Ex nA nC IIA T5 Gc IP20, Ta (see X20 user's manual) FTZÚ 09 ATEX 0083X
UL	cULus E115267 Industrial control equipment
DNV	Temperature: **B** (0 to 55°C) Humidity: **B** (up to 100%) Vibration: **B** (4 g) EMC: **B** (bridge and open deck)
CCS	Yes
LR	ENV1
KR	Yes
ABS	Yes
BV	**EC33B** Temperature: 5 - 55°C Vibration: 4 g EMC: Bridge and open deck
CPU / X2X Link power supply input	
Input voltage	24 VDC -15% / +20%
Input current	Max. 0.7 A
Fuse	Integrated, cannot be replaced
Reverse polarity protection	Yes
CPU / X2X Link power supply output	
Nominal output power	7 W
Parallel connection	No
Redundant operation	No
Overload characteristics	Short-circuit proof, temporary overload
Input I/O power supply	
Input voltage	24 VDC -15% / +20%
Fuse	Required line fuse: Max. 10 A, slow-blow
Reverse polarity protection	No
Output I/O power supply	
Nominal output voltage	24 VDC
Behavior on short circuit	Required line fuse
Permissible contact load	10 A
Interfaces	
Interface IF1	
Signal	RS232 or RS485 [6]
Variant	Connection via 12-pin terminal block X20TB12
Transfer rate	Max. 115.2 kbit/s
Interface IF3	
Signal	CAN bus [2]
Variant	Connection via 12-pin terminal block X20TB12
Transfer rate	Max. 1 Mbit/s

Table 2: X20PS9602 - Technical data

Order number	X20PS9602
Electrical properties	
Electrical isolation	PLC/X2X Link supply not isolated from PLC/X2X Link power supply, and I/O supply not isolated from I/O power supply
Operating conditions	
Mounting orientation	
Horizontal	Yes
Vertical	Yes
Installation elevation above sea level	
0 to 2000 m	No limitation
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Degree of protection per EN 60529	IP20
Ambient conditions	
Temperature	
Operation	
Horizontal mounting orientation	-25 to 60°C
Vertical mounting orientation	-25 to 50°C
Derating	See section "Derating".
Storage	-40 to 85°C
Transport	-40 to 85°C
Relative humidity	
Operation	5 to 95%, non-condensing
Storage	5 to 95%, non-condensing
Transport	5 to 95%, non-condensing
Mechanical properties	
Note	Order 1x terminal block X20TB12 separately. Order 1x Compact-S PLC base X20BB5x, X20BB6x or X20BB7x separately.
Pitch	12.5$^{+0.2}$ mm

Table 2: X20PS9602 - Technical data

1) RS232 interface only in connection with bus module X20BBx2 or X20BBx7.
   RS485 interface only in connection with bus module X20BB53 or X20BB63.
   CAN bus only in connection with bus module X20BB57, X20BB67 or X20BB77.
2) CAN bus only in connection with bus module X20BB57, X20BB67 or X20BB77.
3) RS232 interface only in connection with bus module X20BBx2 or X20BBx7.
4) RS485 interface only in connection with bus module X20BB53 or X20BB63.
5) The specified values are maximum values. For examples of the exact calculation, see section "Mechanical and electrical configuration" in the X20 system user's manual.
6) RS232 interface only in connection with bus module X20BBx2 or X20BBx7.
   RS485 interface only in connection with bus module X20BB53 or X20BB63.

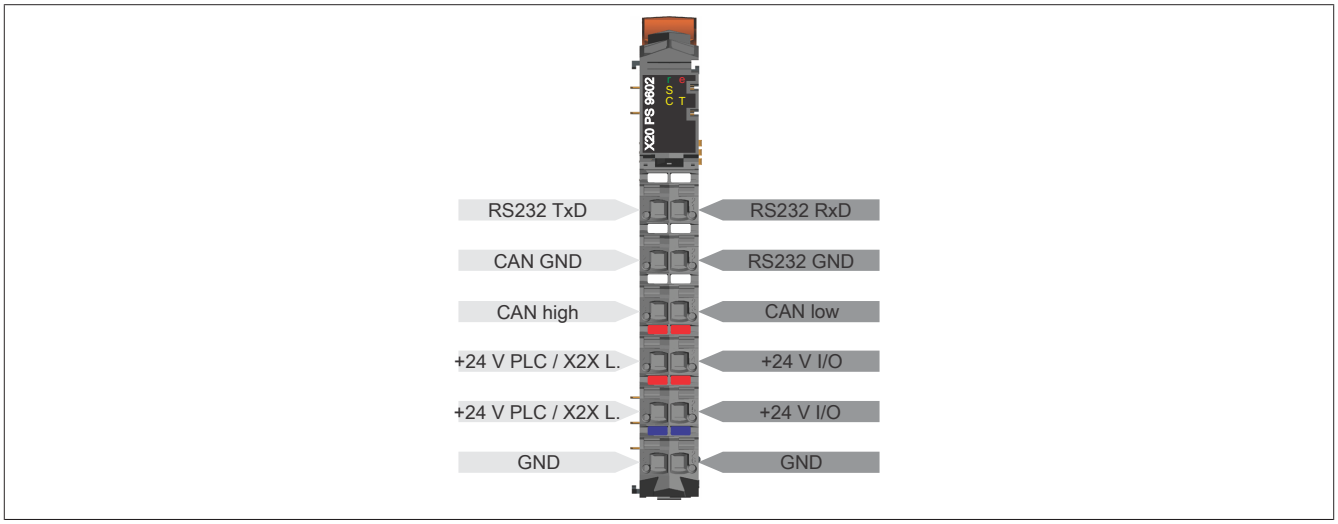
2.2 LED status indicators

For a description of the various operating modes, see section "Additional information - Diagnostic LEDs" in the X20 system user's manual.

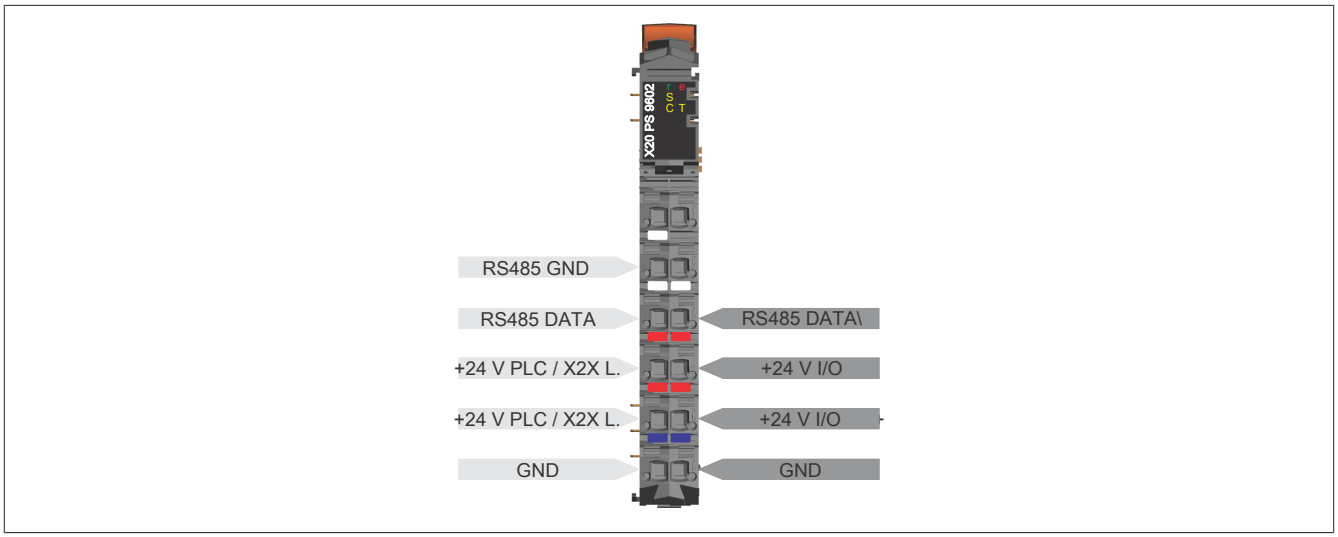
Figure	LED	Color	Status	Description
	r	Green	Off	No power to module
			Single flash	Mode RESET
			Blinking	Mode PREOPERATIONAL
			On	Mode RUN
	e	Red	Off	Module not supplied with power or everything OK
			Double flash	The LED indicates one of the following states: • The controller / X2X Link power supply of the power supply unit is overloaded. • I/O power supply too low • The input voltage for the controller / X2X Link power supply is too low.
	e + r	Solid red / Single green flash		Invalid firmware
	S	Yellow	Off	The controller is not transmitting data via the RS232/RS485 interface.
			On	The controller is transmitting data via the RS232/RS485 interface.
	C	Yellow	Off	The controller is not transmitting data via the CAN bus interface.
			On	The controller is transmitting data via the CAN bus interface.
	T	Yellow	Off	The terminating resistor integrated in bus module X20BBx3 or X20BBx7 is switched off.
			On	The terminating resistor integrated in bus module X20BBx3 or X20BBx7 is switched on.

2.3 Pinout

With bus base X20BBx2 or X20BBx7

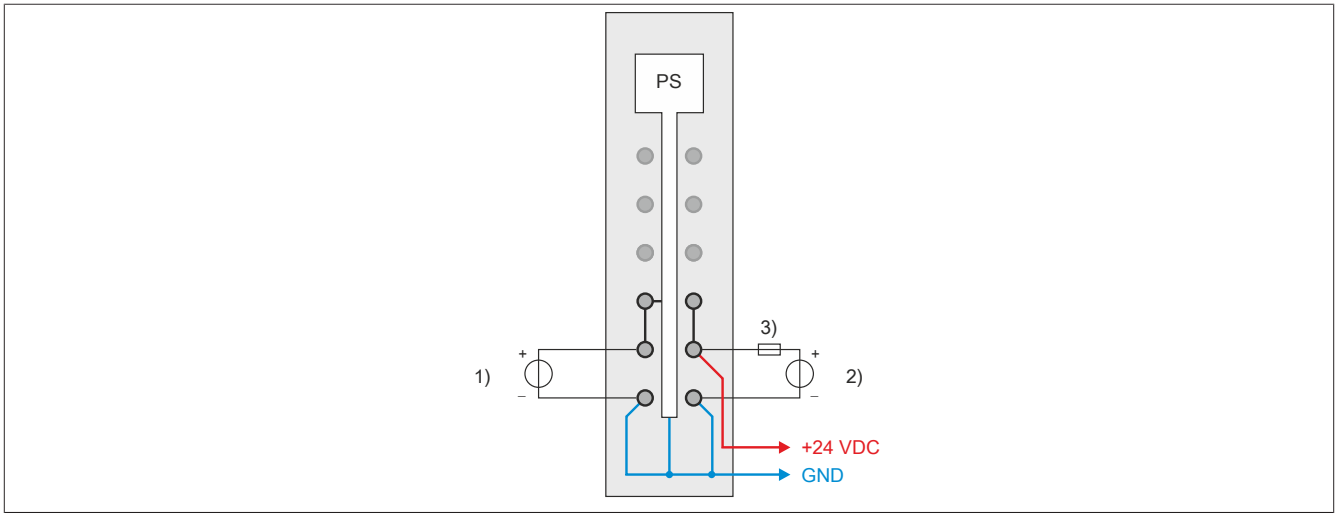


With bus base X20BBx3



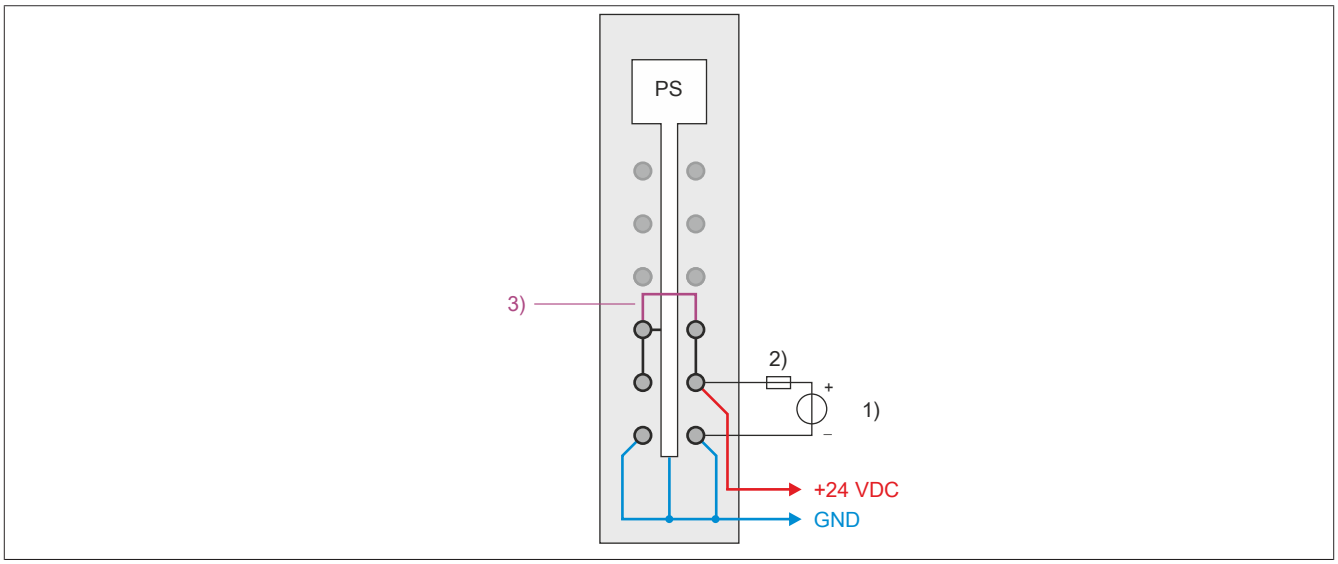
2.4 Connection examples

With 2 isolated power supplies



1) Supply for the PLC or X2X Link power supply
2) Supply for the I/O power supply
3) Fuse, 10 A slow-blow

With 1 power supply and jumper

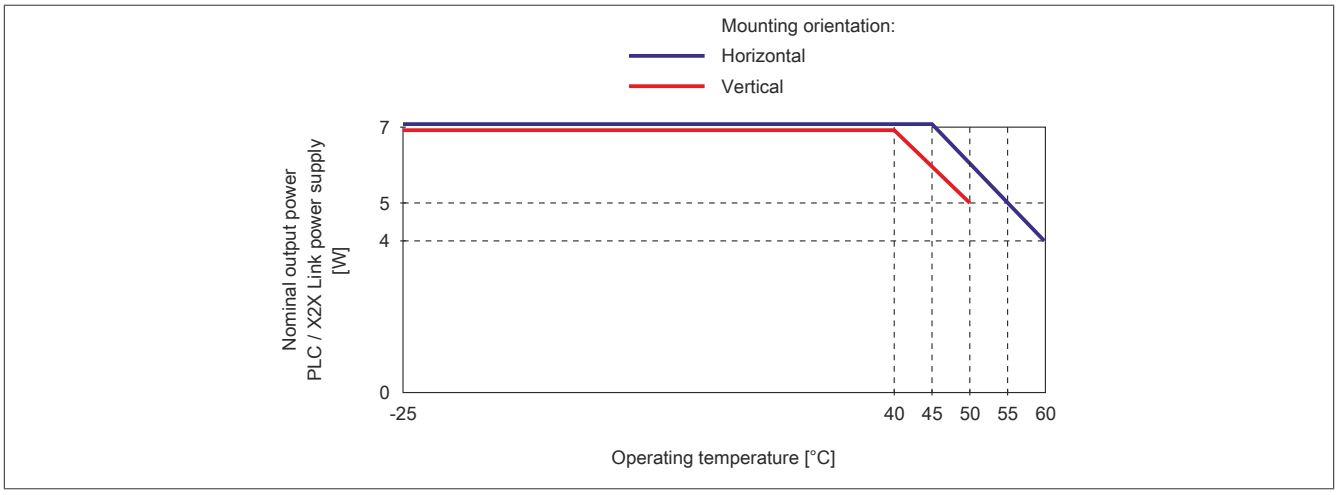


1) Supply for the I/O power supply
2) Fuse, 10 A slow-blow
3) Jumper

2.5 Derating

2.5.1 Controller / X2X Link power supply

The nominal output power for the controller / X2X Link power supply is 7 W. Derating must be taken into account depending on the mounting orientation.



2.5.2 I/O power supply

Information:

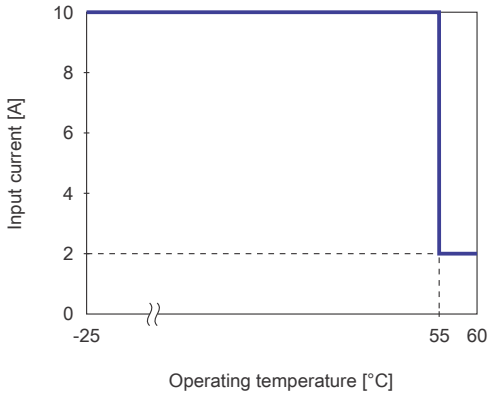
The specified maximum temperature and derating values are based on worst-case conditions. The controller contains an internal temperature sensor that triggers a reset if 95°C is exceeded. Depending on the ambient conditions (artificial convection), maintaining the internal temperature at <90°C can prevent derating.

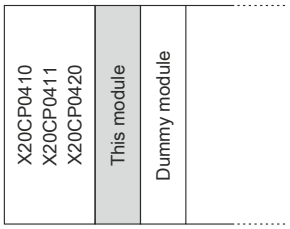
2.5.2.1 X20CP0410, X20CP0411 and X20CP0420

Horizontal mounting orientation

Derating is not required in the temperature range -25 to 55°C. 1 of the following 2 derating variants must be applied at temperatures above 55°C:

Variant 1	Variant 2
Max. 2 A input current on the I/O power supply.	A dummy module must be connected next to the power supply module.





Vertical mounting orientation

Derating is not required in the vertical mounting orientation.

2.5.2.2 X20CP0482, X20CP0483, X20CP0484 and X20CP0484-1

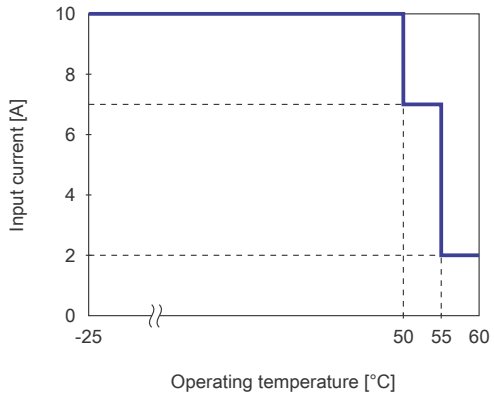
Horizontal mounting orientation

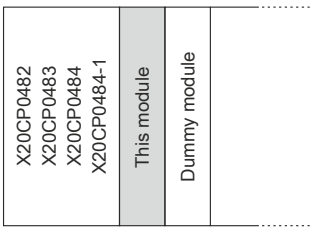
Derating is not required in the temperature range -25 to 50°C. The following 2 derating variants must be applied at temperatures above 50°C.

Information:

Both derating variants must always be applied!

Derating	
The input current on the I/O power supply must be reduced: • Max. 7 A up to 55°C • Max. 2 A up to 60°C	A dummy module must be connected next to the power supply module.





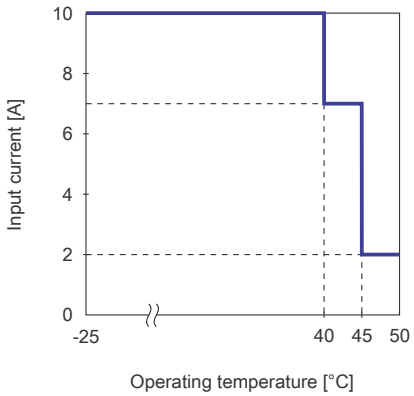
Vertical mounting orientation

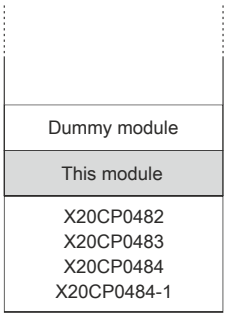
Derating is not required in the temperature range -25 to 40°C. The following 2 derating variants must be applied at temperatures above 40°C.

Information:

Both derating variants must always be applied!

Derating	
The input current on the I/O power supply must be reduced: • Max. 7 A up to 45°C • Max. 2 A up to 50°C	A dummy module must be connected next to the power supply module.





3 Function description

3.1 Monitoring the operating limits

The status of the bus supply voltage can be read out.

Bit	Description
0	No error
1	Warning for undervoltage (<4.7 V)

The status of the I/O supply voltage can be read out.

Bit	Description
0	I/O power supply above the warning limits of (20.4 V)
1	I/O power supply below the warning limits (20.4 V)

Information:

The register is described in "Status of the module" on page 12.

4 Register description

4.1 General data points

In addition to the registers described in the register description, the module has additional general data points. These are not module-specific but contain general information such as serial number and hardware variant.

General data points are described in section "Additional information - General data points" in the X20 System user's manual.

4.2 Function model 0 - Standard

Register	Fixed offset	Name	Data type	Read		Write	
				Cyclic	Acyclic	Cyclic	Acyclic
0	1	Status of the module	USINT	•			
		StatusInput01	Bit 0				
		StatusInput02	Bit 2				
4	3	SupplyVoltage	USINT	•			

Fixed modules require their data points to be in a specific order in the X2X frame. Cyclic access occurs according to a predefined offset, not based on the register address.

Acyclic access continues to be based on the register numbers.

4.3 Status of the module

Name:
Module status

The following module power supply voltages are monitored in this register:

Bus supply voltage:	Bus supply voltage <4.7 V is displayed as a warning.
24 VDC I/O supply voltage:	I/O supply voltage <20.4 V is displayed as a warning.

Data type	Values
USINT	See the bit structure.

Bit structure:

Bit	Name	Value	Information
0	StatusInput01	0	No error
		1	Bus power supply warning - Undervoltage (<4.7 V)
1	Reserved	0	
2	StatusInput02	0	I/O power supply above the warning limit of 20.4 V
		1	I/O power supply below the warning limit of 20.4 V
3 - x	Reserved	0	

4.4 Bus supply voltage

Name:
SupplyVoltage

This register indicates the measured bus supply voltage with a resolution of 0.1 V.

Information:

The nominal bus supply voltage is 5 V and should not fall below 4.7 V.

Function model	Data type
0 - Standard	USINT
254 - Bus controller	UINT

4.5 Minimum cycle time

The minimum cycle time specifies how far the bus cycle can be reduced without communication errors occurring. It is important to note that very fast cycles reduce the idle time available for handling monitoring, diagnostics and acyclic commands.

Minimum cycle time
100 µs

4.6 Minimum I/O update time

The minimum I/O update time specifies how far the bus cycle can be reduced so that an I/O update is performed in each cycle.

Minimum I/O update time
2 ms